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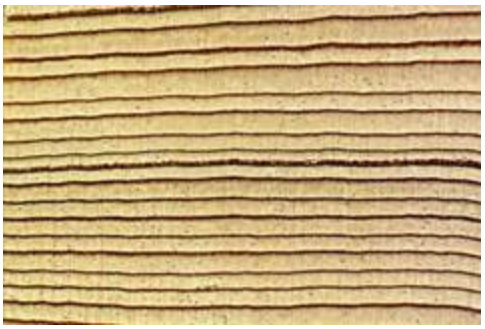
Forensic analysis of wood's chemical signatures could curb illegal logging

Imported wood requires paperwork to prove the lumber is legit, but documents can be forged.
By Brooks Hays | June 2, 2017 at 11:11 AM



The new chemical analysis technique takes just 15 seconds and requires only a tiny sample of wood. Photo by Edgard Espinoza/Botanical Society of America

June 2 (UPI) -- New research suggests chemical forensics could be used to track and stop illegal logging.

According to a new study published in the journal Applications in Plant Sciences, chemical fingerprints can be used to trace lumber's origin.

Almost everything has a chemical signature -- something unique about a sample's chemical makeup that reveals its identity, origin or history. But the signatures aren't necessarily obvious. Recently, a team of researchers with the United States Forest Service found a way to use chemical fingerprinting to distinguish between different populations of Douglas-fir trees.

Microscopic examinations usually suffice to identify the species of tree from which a piece of lumber originated. But identifying where exactly that tree was originally felled isn't so simple.

In some countries, a population of trees from one region may be off-limits to loggers, while the same species from a different population in a disparate region is fair game. Imported wood requires paperwork to prove the lumber is legit, but documents can be forged.

The new chemical fingerprinting technique can be used to confirm a piece of wood came from a region where logging is legal. The chemical screening process takes just 15 seconds and requires only a tiny sample of wood.

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Scientists developed the technique, dubbed DART-TOFMS, using different populations of Douglas-fir from the Pacific Northwest. By comparing the molecular makeup of 188 trees, researchers were able to isolate identifying markers, revealing each tree's origin with an accuracy rate of 70 to 76 percent.

Researchers now hope to understand what accounts for the chemical differences between disparate fir tree populations -- whether tree populations' identifying markers are the product of genetics, environmental factors or a combination of the two.

"If wood chemical profiles are primarily determined by the environment, we could use this technique to predict the climate in which a tree was growing," Richard Cronn, a scientist with the Forest Service's Pacific Northwest Research Station, said in a news release. "If chemical profiles are mainly determined by genetics, this kind of analysis could be used as a rapid screen for determining genetic differences."

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